CHAPTER 2.000

WATER SUPPLY AND DISTRIBUTION SYSTEMS

2.100 GENERAL

There are several alternatives for providing domestic water supply and distribution to properties within Loudoun County. Adopted policies and long-term practice, however, generally favor extensions of existing systems in urban areas and the construction of private, individual systems in rural areas. Applicants are referred to the Comprehensive Plan, for statements as to current policy and to the Zoning Ordinance for statutory limitations on options in certain zoning districts.

Applicants are reminded that, in all cases, the applicable requirements of the Loudoun County Department of Health and/or the Virginia Department of Health, the Virginia Department of Health "Water Works Regulations", State and County codes and/or Town design and construction standards, where applicable, must be met. The applicant is referred to the Codified Ordinances of Loudoun County for local permitting requirements.

The most common domestic water systems in Loudoun County are:

Central Water Systems: The Loudoun County Sanitation Authority (Loudoun Water) is chartered to provide water and sewer service throughout Loudoun County. Loudoun Water's rights to provide service, however, are not exclusive and connection is not mandatory, except as mandated under the provisions of the Zoning Ordinance. While Loudoun Water is under no obligation to provide service, new services will be accepted in accordance with Loudoun Water policy. Loudoun Water's Policy is to require that new facilities be designed and constructed by the applicant, and dedicated to Loudoun Water for operation and maintenance. Loudoun Water has detailed design and construction standards for urban water distribution systems in development areas designated for public water supply systems.

Municipal Water Systems: The incorporated towns of western Loudoun County own and operate municipal water systems. The Comprehensive Plan permits the extension of these utilities to serve adjoining areas, particularly those designated as Joint Land Management Areas. The Towns, however, are not obligated to permit or provide such extensions, and in most cases the extension must be approved at the option of elected officials in both the subject town and the County. The Town of Leesburg has established policies and standards for such extensions in accordance with the annexation agreement.

Communal Water Systems: The Comprehensive Plan designates Loudoun Water as the agency to own and operate communal water systems. Loudoun Water has adopted standards for rural water supply systems to govern villages, hamlets, and other low-density developments. Therefore, applications for rural services will be guided by Loudoun Water and Virginia Department of Health standards, the Codified Ordinances of Loudoun County and Chapter 6 of the Facilities Standards Manual.

Private Water Systems: These are separate stand-alone systems permitted by the Loudoun County Department of Health and/or the Virginia Department of Health to serve individual users. The predominant source of supply is ground water from deep, drilled wells. These systems are generally utilized to serve residential development in rural areas and isolated businesses. Water systems routinely serving more than 25 employees or the public-at-large (restaurants, etc.) may be subject to more stringent state and federal regulations for non-community water supplies.

2.200 DESIGN AND CONSTRUCTION STANDARDS (Public Water Supply and Distribution Systems)

A. The design and construction of all central and communal water supply and distribution systems shall be in strict compliance with the Loudoun Water Engineering Design Manual. Municipal water supply and distribution systems to be operated and maintained by incorporated towns shall be designed and constructed in conformance with the standards and requirements of the town having responsibility for the system. Where such jurisdiction does not have its own design standards, the applicant will meet the requirements as directed by the Health Director.

B. New water wells for potable water shall be designed in accordance with the Codified Ordinances of Loudoun County.

C. Water distribution systems associated with central and municipal water systems shall include provision for fire protection and be designed in accordance with the Codified Ordinances of Loudoun County.

2.201 LOCATION OF WATERMAINS IN REGARD TO PUBLIC RIGHT OF WAY

A. General

Watermains and distribution systems shall be allowed within the right-of-way of any roadway, except within limited access right-of-way, unless as determined by VDOT, there are design or safety issues, which would demand consideration of an alternate location. The preferred location for water mains and distribution systems is within the right-of-way or under the pavement of roadways. In all cases, water mains and distribution systems should be located so as to protect existing trees and vegetation and the Green Infrastructure.

B. Divided Roads

It is the general intent that water mains and distribution systems will not be allowed under the pavement of divided roads having four or more lanes. However, watermains within the right-of-way of such roads may be permitted subject to approval and consensus by VDOT. In accordance with VDOT's policy, the conditions listed in Items 1 through 4 below shall be present to allow placement of the watermain under the pavement of such roads. When watermains are permitted within the pavement of divided roadways, they are to be located five (5) feet from the outside edge of the pavement or seven (7) feet from the face of curb. It

should be noted that for the conditions and situations cited below, VDOT, Loudoun Water or the County may determine that there are compelling design or safety issues which shall demand consideration of an alternate location. In any case, the applicant shall be notified of the appropriate watermain location prior to the approval of the preliminary subdivision application. In instances that require special consideration, applicants are encouraged to seek VDOT, Loudoun Water and County concurrence of the waterline design concept prior to or during the preliminary plan process.

1. When the divided roadway is designed for aesthetic purposes rather than to meet projected traffic volumes.

2. In areas where an existing and sufficient interparcel access is available to provide an alternative route for traffic, as required for watermain maintenance.

3. Existing water lines are located under existing pavement.

4. The extension of water lines under undivided roadways through intersections widened, only through the intersection, to a divided section.

C. Undivided Roads

Watermains will be allowed under the pavement for all undivided roadways unless compelling design or safety issues are identified by VDOT, Loudoun Water or the County, as identified prior to preliminary plat approval. These water mains shall generally be placed within the pavement, no less than five feet from the outside edge of the gutter pan or seven feet from the face of curb.

2.300 WATER SUPPLY WHERE WATER SYSTEMS ARE NOT AVAILABLE FOR FIRE PROTECTION

2.310 GENERAL

This section identifies minimum water supply requirements for fire protection in areas where an extension of central and/or municipal water supply systems, or a communal water system capable of providing adequate water supply for fire protection purposes as approved by the Chief of the Department of Fire, Rescue and Emergency Management, is not available. The requirements contained within this section are minimum requirements, shall be applicable to land development applications which require approval by the County in accordance with the regulations set forth within the Land-Subdivision and Development Ordinance (LSDO), and shall not apply if the subdivision provides the mandated provision of building sprinkler systems within primary residential structures. In case of conflict between this section and standards of another applicable regulation, ordinance, code or law, the more stringent standards shall prevail.

2.320 DEFINITIONS (For purposes of Chapter 2 only)

Natural Water Source: Any natural water sources of cumulative volume capable of satisfying the minimum criteria for fire protection purposes. Examples of natural water sources include, but are not limited to: streams, ponds, rivers, lakes, and creeks or other like sources.

Man Made Water Source: Any man made sources of cumulative volume capable of supplying a minimum of 30,000 gallons of water year-round for fire protection purposes. Examples of man made water sources include, but are not limited to: cisterns, swimming pools, quarries, storage tanks, and other like sources.

Water Supply Facility: Any natural or man made water source that is designated to supply water for fire protection purposes, including associated equipment such as, but not limited to, tanks, pipes, and dry hydrants.

2.330 DESIGN REQUIREMENTS

Detailed data, calculations, and other design information determining both the water supply required and the water supply available for fire protection purposes shall be provided on applicable land development applications. Water supply facilities shall be designed and constructed in accordance with the following specifications, and shall be approved by the Chief of the Department of Fire, Rescue and Emergency Management or his designee:

A. Water supply facilities shall be required to serve hamlet subdivisions in the A-10 and A-3 zoning districts, principal/subordinate subdivisions cumulatively totaling more than five buildable lots in the AR-1 and AR-2 zoning districts, cluster subdivisions in the AR-1 and AR-2 zoning districts, or where otherwise required pursuant to proffers or conditions of approval of special exceptions. Voluntary water supply facilities may also be provided. All water supply facilities shall meet the following design parameters:

   1. Required water supply facilities using storage tanks shall consist of either two (2) tanks that each provide a minimum of 15,000 gallons of storage capacity, or one (1) tank that provides a minimum of 30,000 gallons of storage capacity. Voluntary water supply facilities using storage tanks shall consist of at least one (1) tank that provides a minimum of 15,000 gallons of storage capacity. See Figures 1 and 2 at the end of this Chapter.

   2. Required water supply facilities shall be spaced every 2,600 linear feet of roadway or other spacing approved by the Chief of the Department of Fire, Rescue and Emergency Management or his designee.

   3. The water supply facility shall be located within an easement granted to the County. Such easement shall extend 10 feet beyond any drafting pipe, storage tank, or other associated appurtenance. Where a pond is designated as a water supply facility, the entire pond shall be located within the easement.

4. Natural water sources, designated as a water supply facility, shall satisfy the following minimum criteria:

   a. Streams, rivers, and creeks to be designated as natural water sources shall be capable of providing 1,000 gallons per minute of water supply for thirty minutes for fire protection purposes year-round.

   OR

   b. Designated natural water sources with contributory watersheds, such as, without limitation, ponds, quarries, and other open impoundments, shall have a normal depth of five (5) feet at the draft pipe and contain a minimum of 30,000 gallons of water year-round.

5. Permanent provision shall be made for the private maintenance, repair, and replacement of water supply facilities to ensure the operational integrity of said facilities, unless, on a case-by-case basis, the County, at its sole discretion, assumes certain maintenance responsibilities detailed in a water supply facility maintenance agreement between the property owner and the County.

B. Access: All designated water supply facilities shall be accessible by a VDOT right-of-way, a Fire Apparatus Access Road as that term is defined in Chapter 4 of this Manual, or other travelway that is a minimum of 20 feet wide, capable of supporting a 34-ton vehicle (H-20 loading) in all weather conditions, located within an emergency access easement, and identified as a fire lane in accordance with FSM Chapter 4, Diagram 16, or otherwise approved by the Chief of the Department of Fire, Rescue and Emergency Management or his designee.

   1. Dry hydrants may be treated as standard fire hydrants and located within VDOT or private road rights-of-way or easements.

C. Signage: Signs shall comply with the design requirements and installation specifications shown in Figure 3 at the end of this Chapter.

D. Construction: Minimum specifications for construction of water supply facilities are shown in Figure 1 and Figure 2 at the end of this Chapter and should be adhered to in all cases, unless otherwise authorized by the Chief of the Department of Fire, and Rescue and Emergency Management.

2.400 WATER SUPPLY AND DISTRIBUTION SYSTEM REFERENCES

"Waterworks Regulation", Commonwealth of Virginia/State Department of Health.

"Guide for Determination of Required Fire/Flow", Insurance Services Office, 160 Water Street, New York, NY 10038.

"Grading Schedule for Municipal Fire Protection", Insurance Services Office, 160 Water Street, New York, NY 10038.

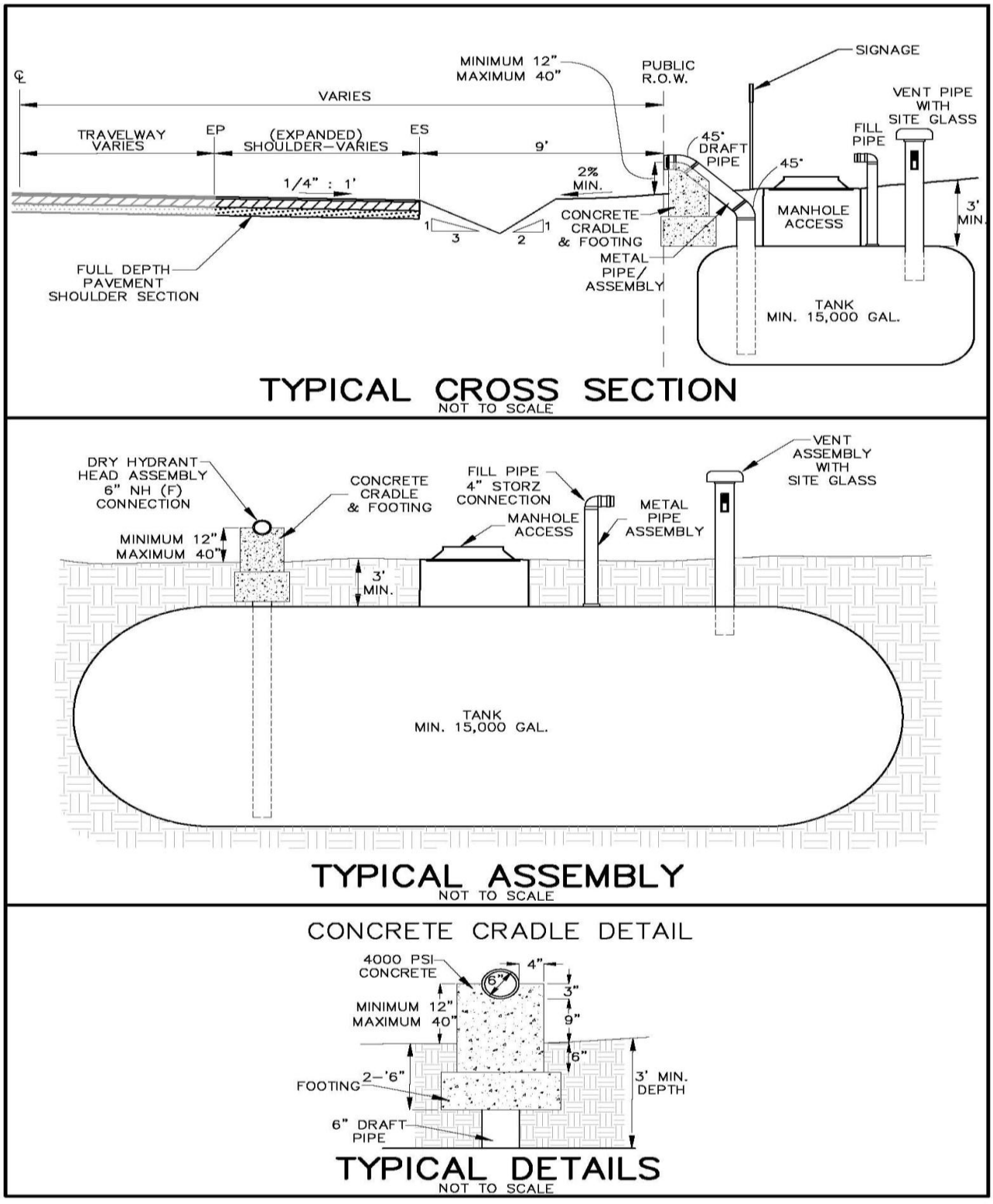
"Loudoun Water Engineering Design Manual".

"Codified Ordinances of Loudoun County, Chapters 1040 Water Wells, 1042 Water Systems and 1044 Water Supply Emergency".

“Codified Ordinances of Loudoun County, Chapter 1410 Virginia Uniform Statewide Building Code”.

"AWWA Standards", American Water Works Association.

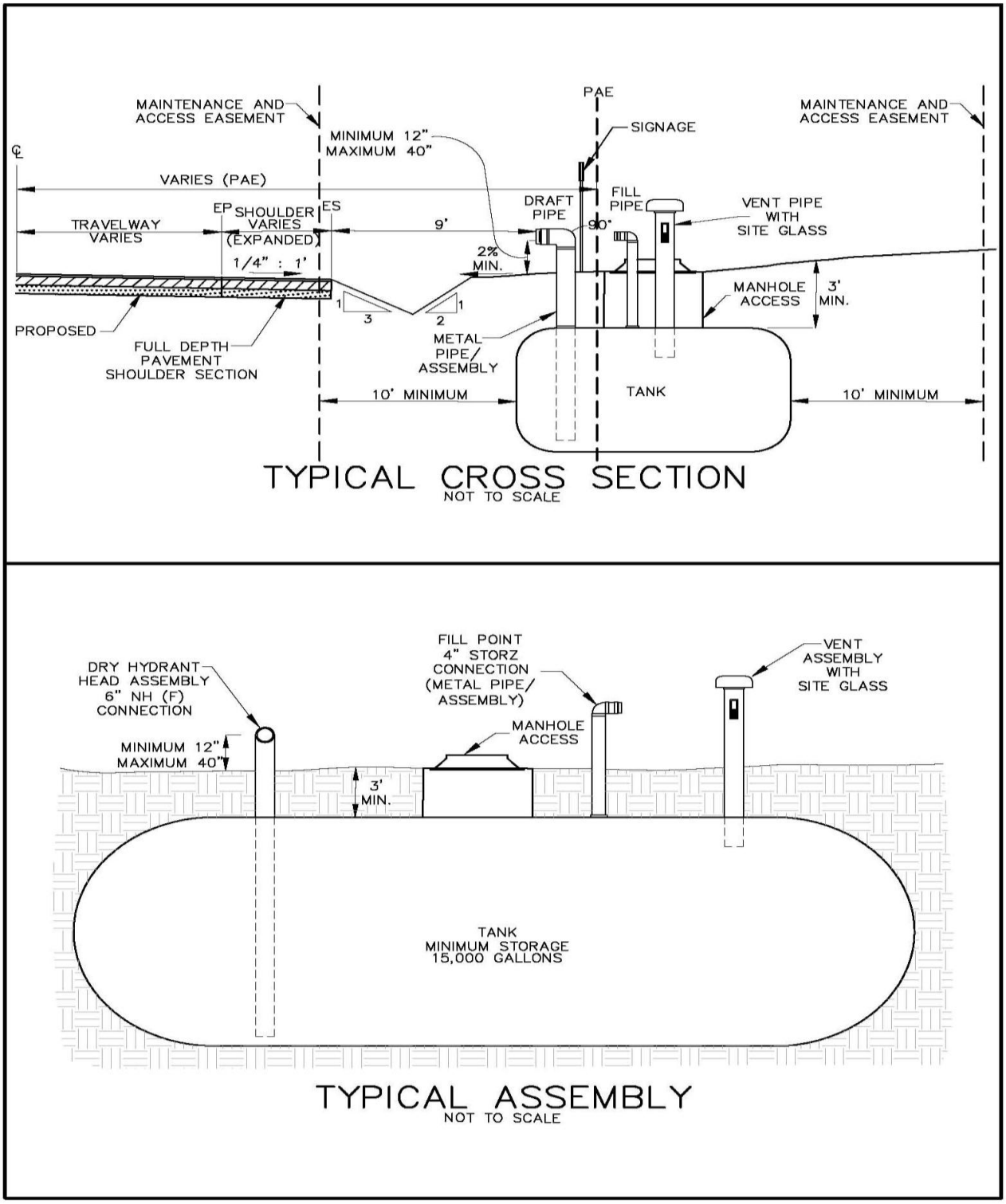
"NFPA Standards", National Fire Protection Association.



DRY DRAFTING HYDRANT
FIRE TANK DETAIL
(PUBLIC ROW)

NOT TO SCALE

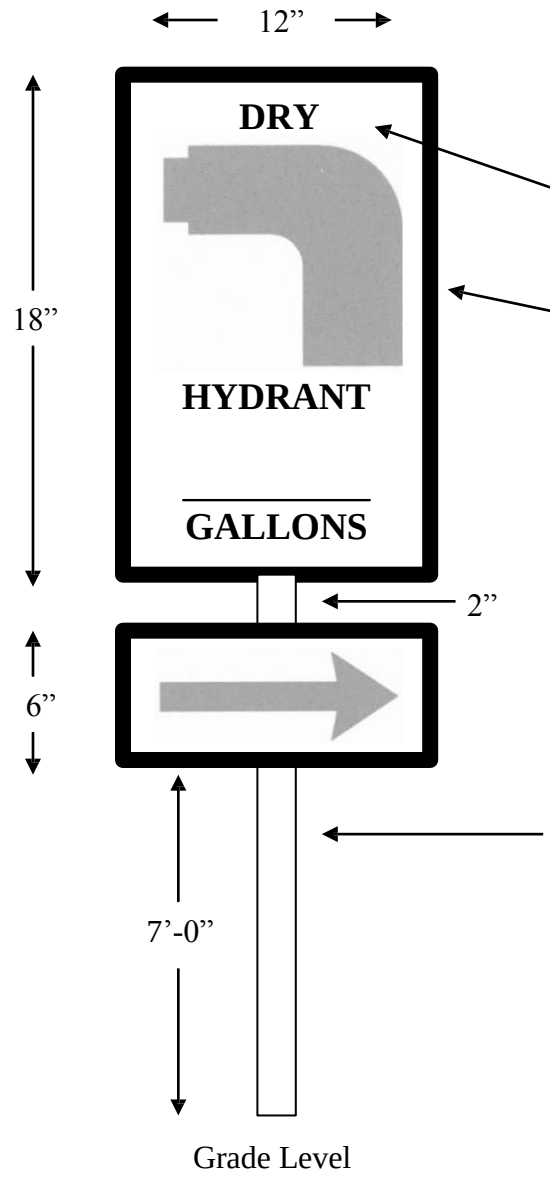
Figure 1



DRY DRAFTING HYDRANT
FIRE TANK DETAIL
(PRIVATE ACCESS ESMT)
NOT TO SCALE

Figure 2

Dry Hydrant Sign Type and Specifications



(1) Each such sign shall be of reflective metal construction, with dimensions of at least twelve by eighteen inches.

(2) Each such sign shall show red letters on a white background,

with a three-eighths inch red trim strip around the entire outer edge of the sign,

the lettering shall state "Dry Hydrant" in at least three-inch high letters, and

if a tank is present, the storage capacity of the tank in gallons shall also be shown in at least three-inch high letters.

(3) If the sign is not mounted on the drafting pipe, a red arrow sign with dimensions of at least six by twelve inches shall containing a red arrow shall also be included and point to and indicate the location of the dry hydrant.

(4) Signs not mounted on a bollard or the drafting pipe shall be securely mounted on a post seven feet from grade level to the bottom of the sign and must be within seven feet of the parking curb or curb line.

FIGURE 3